June 2001

Environmental Technology Verification Program

Policy Compendium

U.S. Environmental Protection Agency

ETV Program Policy Compendium

This policy compendium contains a summation of operational decisions made to date by participants in the U.S. Environmental Protection Agency's (EPA) Environmental Technology Verification (ETV) Program. These participants include the EPA Team and their line managers, the ETV verification organizations, the EPA Science Advisory Board, the various stakeholder groups participating in the program, and interested outside organizations such as the White House Environmental Technology Task Force and the Congress. The policies contained herein evolved from decisions made during the original concept period (1993 to 1995), the operation of the actual pilot period (October 1995 to September 2000), and subsequently. As such, the policies are and will continue to be modified as necessary and, although they generally apply to the entire ETV Program, there may be exceptions to which certain policies may not apply. The main source for each policy is cited after each policy statement. The primary sources include ETV publications, such as the *ETV Program Verification Strategy* (EPA 1997) and *ETV Quality and Management Plan* (EPA 1998), and information from ETV Team meetings and workshops.

Policies are valid as of the date of issuance (each page is dated for reader clarity), and the document will be updated periodically. This means that different versions of this document may have different policies, and the reader is cautioned to rely on the latest version for up-to-date information. As an example of the evolutionary nature of the ETV Policy Compendium, the first version of the *ETV Program Verification Strategy* in 1997 stated that the program would operate 10 pilots for a period of three years. Subsequent decisions added two pilots, which increased the number of pilots to 12, and changed the pilot program duration to five years. The latter changes are reflected in this document. Similarly, after the pilot period ended in September 2000, the ETV Program began a transition from 12 pilots to six ETV Centers. This transition is reflected in the policies as appropriate.

The ETV Policy Compendium is divided into two main sections. Section 1.0 addresses core policies that generally cover all of the ETV Centers throughout the duration of the program. Section 2.0 explains policies that apply to individual steps in the organizational and operational phases of the ETV Program.

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1.0 Core Policies

1.1 General ETV Program Policies

1.1.1 Definitions

The following terms used in this Policy Compendium and other ETV documents are defined accordingly.

- *Commercial-ready technology*: The technology is either in, or ready for, full-scale commercial production and has a high probability of being effective.

- *Technology category*: A group of technologies that are the same type of equipment and used in the same application or a group of technologies that are different types of equipment that are used in the same application.

- *Stakeholder groups*: Groups if individuals that can provide valuable input to the program and/or use the verification information, including representatives of any or all of the following verification customer groups: buyers and users of technology, technology developers and vendors, the consulting engineers, the finance and export communities, and government permitters and regulators.

- *Verification test*: Procedures performed by a third party to establish or prove the truth of the performance of a technology under specific, predetermined criteria or protocols and adequate data quality assurance procedures.

- *Verification report*: The report, developed by the verification organization and approved by EPA, of the methods used in and the result of an individual technology test.

- *Verification statement*: A summary statement based on the verification report, developed by the verification organization and approved by EPA, which reports individual technology performance.

1.1.2 ETV began with a five-year pilot period that culminates in a Report to Congress

The ETV Program began with a five-year pilot phase to test a wide range of partner and procedural alternatives, as well as the actual market demand for and response to such a program. Twelve pilots covering all areas of environmental technology were brought on line over a roughly three-year period starting in October 1995. The ultimate objective of the pilot phase was to design and implement a permanent verification capacity and program within EPA should the evaluation of the effectiveness of the program warrant it. The costs and effectiveness of the ETV Program were closely monitored throughout the pilot period, which ended in September 2000. EPA intends to make recommendations to Congress in October 2001 on whether and in what form a verification program should continue. It is important to note that, although the Report to Congress data collection period ended in December 2000, the ETV Program is continuing without loss of momentum after that date in substantially the same form until final decisions are made by the Agency and/or Congress. Specifically, new solicitations will be issued for

verification organizations after the five-year pilot period as described in Section 2.1.1 below. ETV Centers will continue operations in the interim period between the end of the first five-year cooperative agreement and the response from the Report to Congress in 2001.

Policy Source - Verification Strategy 1997, ETV Fact Sheet 1998

1.1.3 The Report to Congress will answer four major questions

The Report to Congress, which will make recommendations on whether and in what form a verification program should continue, will answer four major questions:

1. Does the environmental marketplace need/value an EPA verification program?

2. Is the need different from one technology area to another?

3. Can we design a credible program that the developer community can afford?

4. Where is the value added from ETV:
   -- Protocol development?
   -- Third-party QA oversight?
   -- EPA verification statement?

Policy Source - April 1998 Team Meeting

1.1.4 The ETV Program allows wide latitude in procedures to test operational alternatives and seek optimized, high quality verification testing and reporting

In order to identify the most efficient and cost-effective verification methods, the ETV Program allows for flexibility to test alternative ways of conducting similar activities. Managers, operators, and stakeholders are encouraged to be innovative in seeking methods and processes that allow the verification of technologies to be conducted as rapidly and efficiently as possible within the legitimate constraints of the need for quality assured data. Throughout the pilot period and thereafter, improvements and changes to procedures are to be expected and are encouraged.

Policy Source - EPA ETV Staff

1.1.5 ETV Program participants collect information through various mechanisms to give constant feedback on potential improvements

To assess efficiency and cost-effectiveness, the ETV Program incorporates several mechanisms to ensure that constant feedback on potential improvements is received by all participants.

1. The first feedback mechanism is the ongoing data collection and annual program review reports, which identify the progress, costs, limitations, and lessons learned for each ETV Center and for the ETV Program as a whole. The data for these reports are collected by independent contractors who are assigned to track each ETV Center for the entire year.

2. The second feedback mechanism is biweekly ETV Team conference calls and quarterly ETV verification organization conference calls, which allow the people managing ETV Centers to share positive and negative experiences with each other and with the ETV Program Director.

3. The third feedback mechanism is semiannual ETV Team training meetings (which include verification organization managers), as needed, that allow ETV Center managers to see a full overview of program activities that have taken place within the last six (or more) months and learn from both the positive and negative experiences of others. These meetings are limited generally to program participants in order to encourage maximum candor and learning.

4. The fourth feedback mechanism is structured customer service interviews of vendors with verified technologies. These interviews are conducted soon after a verification is completed and on an annual basis thereafter. Other interview and/or survey mechanisms may be designed and implemented as warranted.

Each of these feedback mechanisms provides the ETV Program Director, EPA Center managers, and verification organizations with information necessary to make ongoing improvements to the ETV Program.

Policy Source - May 2001 Team Meeting

1.1.6 Evaluation of the pilot period will determine the ETV Program's future

The Agency collects data on operational parameters and on outcomes in order to evaluate all aspects of the program. The measures of success are defined in the *ETV Quality and Management Plan* and are listed below.

Timing

No more than one year for verification organization selection.
After the verification organization is selected, no more than one year for the organizational phase (i.e., stakeholder selection, technology prioritization, initial generic protocol development, stakeholder approval of generic protocols).
For each technology test event, no more than one year between vendor meeting and draft final report.
No more than two months for EPA approval and one month for publication of verification reports and statements.

Customer Satisfaction

Significant number of states accept ETV data for permitting.
Significant number of consulting engineers use ETV data for making technology recommendations.

Effects

Vendor sales data; technology use data.

EPA will seek to use this information to make long-term recommendations to Congress on the future and shape of the program in October 2001. Among the choices at that time will be the formulation of a permanent, broad scale program; the narrowing of efforts to certain areas in which ETV appears to

be effective; or the discontinuance of EPA-sponsored verification efforts. The latter conclusion could be reached either because state regulators/permit writers and the technology innovation industry are not assisted by ETV or because the cost of verification proves to be prohibitive.

Policy Source - Verification Strategy 1997, November 1997 Team Meeting, ETV Program QMP 1998

1.1.7 Over the course of the pilot period, the costs of technology testing within each of the pilots will gradually move from being supported primarily by EPA to being supported by the vendor community

Over the five-year pilot phase of the program, the costs of verifying technologies in many pilots shifted from being primarily government funded to incorporating substantial private sector funding (e.g., participating vendors, others). Testing in at least one pilot has been fully vendor supported from the beginning. The original 1994 verification white paper called for complete private sector sponsorship within three years. A 1995 EPA Science Advisory Board (SAB) review, however, concluded that such a goal was probably not achievable in such a short timeframe (the SAB suggested five to eight years) and that some level of government support (10 to 20 percent of ongoing costs) would remain necessary to keep the activity viable. Conclusions on this issue will have to be reached as data emerge on the economic value-added of the program and the level of cost that the private sector is willing to bear in the various technology sectors.

Policy Source - Verification Strategy 1997

1.1.8 Technology performance evaluations focus on performance characteristics

The ETV Program evaluates environmental technologies to ascertain and report on their performance characteristics. Under the ETV Program, EPA and its partners do *not*: (1) seek to determine regulatory compliance; (2) rank technologies or compare their performance; (3) label or list technologies as acceptable or unacceptable; or (4) seek to determine "best available technology" in any form. In general, the ETV Program will avoid all potential pathways to picking "winners and losers." The goal of the program is to make objective performance information available to all of the actors in the environmental marketplace for their consideration and decision making.

Policy Source - Verification Strategy 1997

1.1.9 ETV verification is expressly defined

EPA is sponsoring the evaluation of environmental technologies through testing and verifying that they perform at the tested levels reported. By verify, EPA means to establish or prove the truth of the performance of a technology under specific, predetermined criteria or protocols and adequate data quality assurance procedures (i.e., confirm, corroborate, substantiate, validate). EPA verification does not imply that technologies will always perform as they performed under ETV testing, nor that they will perform in the same manner under circumstances different from those tested. Most specifically, *ETV does not "certify," guarantee, or warrant the performance of technologies.*

Policy Source - Verification Strategy 1997

1.1.10 The program seeks to provide high quality data to purchasers and permitters on the performance characteristics of technologies

The stated goal of the ETV Program is "to verify the environmental performance characteristics of commercial-ready technology through the evaluation of objective and quality assured data, so that potential purchasers and permitters are provided with an independent and credible assessment of what they are buying and permitting." This means that the provision of data and information on performance characteristics must cover legitimate information that purchasers and permitters need to make decisions. For this reason, ETV does not simply verify the claims of vendors (although it may do this also), but instead looks to stakeholders to define the data and operational parameters that must be known in order to make a purchase, use, or permitting decision.

Policy Source - Verification Strategy 1997

1.1.11 The ETV Program has established programmatic quality criteria

The ETV Program has determined that the following five criteria are crucial to the operation of technology verification programs in order to achieve the overall goal of assisting the marketplace to make better environmental technology decisions.

First, programs must be fair and equally available to all participants. Therefore:

1. Testing will be available to and consistent for all vendors of commercial-ready technologies within defined categories being evaluated.

Second, credibility of data is the only value-added that verification provides to the marketplace. Therefore:

2. All ETV tests will be conducted by objective, third-party testing organizations having no financial or other interests in the technology.

3. Protocols and/or test plans developed in advance of testing, which are publicly available and capable of reproduction, will be used throughout the program.

Third, the program will operate with full transparency. Therefore:

4. Results of all ETV evaluations and verifications will be published in reports that are available to all interested parties.

Fourth, quality programs depend on quality data. Therefore:

5. All ETV Centers will operate under a quality management plan and through quality procedures (e.g., audits and quality assurance reviews) that assure the production of data of an acceptable level for verification.

Policy Source - February 1997 Team Meeting

1.1.12 Key players in the ETV Program have clearly delineated roles

On a day-to-day basis, the ETV Program is implemented by the members of the ETV Team, the various verification organizations, and appropriate EPA line management. The ETV Team, which was formed in early 1995, consists of EPA personnel who are involved in the program, including appropriate Office of Research and Development (ORD) staff, program office personnel, and regional office representatives. The verification organizations are the entities conducting actual verification operations (see Section 2.1.1 below). In the 1998 *ETV Quality and Management Plan* (QMP), formal assignments of the duties of all defined participants were delineated. The reader is referred to Section 1.2 of the ETV QMP for explanations of these roles.

Policy Source - ETV Program QMP 1998

1.1.13 Records are to be maintained in accordance with specific procedures

The scope and definition of ETV documents have been defined. In addition, procedures have been established for the development, control, and maintenance of all ETV documents. These definitions and procedures are found in Section 5.0 of the ETV QMP. The majority of ETV documents are posted on the ETV web site at www.epa.gov/etv.

Policy Source - ETV Program QMP 1998

1.1.14 Cooperative agreements and partnerships with other organizations occur under the auspices of Agency-negotiated MOA

From time to time, EPA may partner with other organizations, including private sector associations, states, other federal agencies, and other countries, to conduct verification activities when the goals and objectives of these organizations coincide with those of ETV. In general, these partnerships will occur under the auspices of Agency-negotiated memoranda of agreement (MOA), conform to all applicable laws and regulations as specified in the individual MOA, operate under the provisions of the ETV QMP, and conform to the programmatic quality criteria specified in Section 1.1.11 of this Policy Compendium. Operational procedures, such as responsibilities for evaluation and implementation of joint recognition, are specified in each MOA.

Policy Source - May 2001 Team Meeting

1.2 Technology Coverage and Eligibility

1.2.1 ETV is a voluntary program

Technology vendor participation in the ETV Program is completely voluntary. Vendors of environmental technologies and other actors in the environmental marketplace are not required to participate in the program, nor are they required to seek verification. The program goal is to provide objective technology performance information to the environmental marketplace. Vendors who believe that such information would be of value to their marketing activities are encouraged to participate as appropriate.

Policy Source - Verification Strategy 1997

1.2.2 Participating technologies must be commercial-ready

The ETV Program serves the domestic and international marketplaces to encourage rapid acceptance and implementation of innovative environmental technologies. Therefore, ETV focuses its resources on verification of environmental technologies that are either in, or ready for, full-scale commercialization. The ETV Program does *not* evaluate technologies in research and development and does *not* conduct or support technology research.

Policy Source - Verification Strategy 1997

1.2.3 Program focus is primarily on private sector technologies

One of the purposes of the ETV Program is to accelerate the development and acceptance of improved environmental technologies through objective verification and reporting of technology performance. One way to accomplish this goal is to provide verification of technologies that have clear domestic and international market niches with a potential for substantial increases in technology sales and use. Increasing technology sales and use can best be accomplished by focusing on technologies developed by private sector companies, which, in comparison to government-developed technologies, are more likely to be bought and sold in the environmental marketplace. While government-developed technologies can be, and in one case have been, verified under ETV, the program's emphasis is clearly on the private sector.

Policy Source - Verification Strategy 1997

1.2.4 Services and technologies that are closely linked to services cannot be verified under the ETV Program

At the present time, verification testing is limited to technologies (hardware and software) and does not include services or technologies that are linked to services. The performance of services is often linked to the staff that provide the services. For example, wetlands design is often considered to be a watershed protection technology, but the performance of an artificial wetland is closely linked to the personnel who design and construct the wetland. Therefore, verification of the service would amount to verification of the staff's capabilities. Any staff change would instantly create a change in the performance of the service, making the verification statement and report inaccurate and invalid.

Policy Source - May 2001 Team Meeting

1.2.5 Technologies owned or marketed by non-U.S. developers are eligible for verification

All vendors may participate in the ETV Program, including those located outside the U.S. In general, foreign vendors who seek verification testing outside the U.S. will be required to pay the full incremental cost of such an evaluation (including costs for developing the test plan, conducting testing and QA, and travel and related expenses), as noted in Section 2.7.8. Exceptions may be made based on case-by-case evaluations of the cost-effectiveness of testing at locations outside the U.S. and based on the expected environmental benefits of the technology.

Policy Source - May 2001 Team Meeting

2.0 ETV Process Policies

Policies in this section are organized according to the 10 main steps of the ETV process, as presented in the *ETV Program Verification Strategy* (EPA 1997).

2.1 Solicitation and Selection of the Verification Organization

2.1.1 Third-party verification organizations participate in the verification process

In developing the ETV Centers, EPA leveraged the capacity, expertise, and existing facilities of others through third-party partnerships to achieve universal coverage for all technology types as rapidly as possible. All six ETV Centers have at least one third-party verification organization. Third-party verification organizations have been chosen from both the public and private sector, including states, universities, associations, business consortia, private firms, and federal laboratories. EPA designs and conducts auditing and oversight procedures of these organizations, as appropriate, to assure the credibility of the process and data. To evaluate if EPA participation is important to the verification and commercialization process, ETV tested the option of one totally independent private sector pilot in which EPA's role was mainly fiduciary. The selection process for verification organizations is delineated in Section 1.4 of the ETV QMP.

Policy Source - Verification Strategy 1997

2.1.2 Verification organizations and their subcontractors must comply with the ETV Quality and Management Plan

Section 2.4 of the ETV QMP details the quality expectations for technologies and services under the program. Verification organizations and their subcontractors must comply with these expectations and other quality systems described in the QMP.

Policy Source - ETV Program QMP 1998

2.1.3 ETV Center Quality Management Plans must be reviewed and approved by EPA

Each ETV Center is required to develop a formal document describing the quality management system that will be followed to assure appropriate levels of data collection, quality outputs, and customer responsiveness. This document, referred to as the "Center Quality Management Plan (QMP)," is developed by the verification organization and is based on the ETV QMP and/or the quality management system of the verification organization. After the verification organization has drafted the Center QMP, the document is submitted to the EPA Center QA manager and the EPA Center manager for review and approval. The Center QMPs will replace individual pilot QMPs.

Policy Source - ETV Program QMP 1998

2.2 Formation and Maintenance of Stakeholder Groups

2.2.1 Stakeholder groups have balanced membership and represent customer groups

Stakeholder groups are formed consisting of representatives of groups expected to use the information developed from the testing of technologies within that technology area. In general,

stakeholders include representatives of appropriate ETV "customers." The program defines ETV customers to be buyers and users of environmental technology, technology developers and vendors, and technology "enablers," i.e., the consulting engineering community that recommends technology alternatives to purchasers, state (and sometimes local) permitters and federal regulators who allow it to be used, the financial community, and occasionally technology exporters.

Stakeholder groups' responsibilities may include assisting in development of generic verification protocols; assisting in setting priorities regarding the types of technologies to be verified; reviewing specific procedures and selected verification reports emerging from the ETV Center; assisting in the definition and conduct of outreach activities appropriate to the technology area and customer groups; and serving as information conduits to the particular constituencies that each member represents.

Policy Source - Verification Strategy 1997, ETV Program QMP 1998

2.2.2 Regular and publicly announced and open stakeholder meetings are held

Stakeholder groups generally meet no less than once a year and, especially in the beginning stages, meetings may occur two to four times a year. Meetings are publicly announced and open and participants, whether formal members of the group or not, are considered important potential contributors. Stakeholders typically maintain continued communication between meetings by participating in conference calls or task groups or by participating in other forms of communication. Stakeholder subgroups, such as technology panels, might meet more frequently than the full group.

Policy Source - 1996 Team Meeting

2.2.3 ETV stakeholder groups are not subject to the Federal Advisory Committee Act

Stakeholder groups formed under the ETV Program are not Federal Advisory Committees. Federal Advisory Committees are formed under the auspices of the Federal Advisory Committee Act (FACA). FACA committees are established or utilized by a government agency to provide formal advice and recommendations, and they only include members who are not employees of the federal government. Under the ETV Program, the primary purpose of the stakeholder groups is to seek a diversity of opinions based on the members' expertise and the interests of the diverse groups they represent, in contrast to the formal advice provided to federal agencies by FACA committees. In general, the role of stakeholders in the ETV Program is to help set priorities regarding the types of technologies to be verified, assist in the development of technology testing procedures and protocols, review important documents emerging from the ETV Center, assist in defining and conducting outreach activities appropriate to the particular area, and serve as information conduits to the particular constituencies that they represent. ETV seeks a diversity of opinions from the various stakeholder group representatives. Although the ETV stakeholder groups provide input and suggestions to the program, they are not governed by the formalities required for FACA committees. Specifically, the stakeholder groups do not give formal advice, do not seek consensus on issues and decisions, and typically do not formally vote on recommendations.

Policy Source - November 1997 Workshop

2.3 Setting Technology Priorities

2.3.1 Stakeholder groups provide input for setting technology priorities

Because of the impossibility of addressing all technologies that vendors may want to be verified, priorities must be established. The stakeholder groups assist ETV in this important function by representing the marketplace for a given group of environmental technologies in terms of need and feasibility. Although numerous differences in the prioritization process exist from one technology market to another, in general, three criteria for selection are considered. First, there must be a legitimate environmental need for the technology. Second, there must be at least one commercial-ready technology available for testing. Third, testing protocols must be available or capable of being developed within a reasonable timeframe and cost range to make the verification activity feasible within the constraints of ETV funding.

Policy Source - October 1998 Team Meeting

2.4 Development of Generic Verification Protocols

2.4.1 Generic verification protocols and test plans are developed for each ETV Center

Each ETV Center will typically develop a generic protocol and/or test plan(s) for use in conducting verifications in each technology category. The generic protocols and/or test plans should be developed with sufficient detail so that ETV or other testing organizations could duplicate the test and obtain similar results. The generic protocols and/or test plans developed are publicly available on the ETV web site.

Generic protocols provide verification testing guidance for a particular technology category, but *not* for a specific technology, specific test facility or site, or specific test event. The generic protocol should be broad enough to guide testing of different technologies falling into the technology category, yet detailed enough to be usable by a third party to guide similar testing efforts on technologies in the category.

Test plans are documents providing detailed instructions for the verification testing of a single technology, or a group of technologies in the same test group, during a specific test event. The test plan is specific as to technologies to be tested, timing (i.e., lays out a schedule), and place (i.e., identifies the exact test facility or site). It should be detailed and specific enough to allow a third party to reproduce the testing results. A separate test plan is developed for each test event.

Policy Source - Verification Strategy 1997, ETV Program QMP 1998, April 1999 Team Meeting, Review of Implementation of Quality Management in the ETV Program 2000

2.4.2 Generic verification protocols and test plans undergo a specific preparation process

In general, generic protocols and test plans under ETV are developed in the following manner after a technology or technology category is selected for verification.

1. Typically, a generic protocol (i.e., non-product-specific) is first developed for each technology category to be tested, followed by development of a specific test plan (based on the generic protocol) for each item or group of items to be verified in a given test "event." Draft generic protocols and specific test plans both are developed by whatever process the individual

managers, verification organizations, and stakeholders deem appropriate, efficient, and fair. These may include, but are not limited to, expert in-house or consultant development, technical panel formation and development, vendor design followed by stakeholder review, or any combination of the above. Stakeholder groups and participating vendors are given the opportunity to comment on draft generic protocols and test plans, regardless of how they are developed.

[Note: In some cases, the experimental design within a generic protocol or test plan may be specific to a matrix/contaminant, rather than a specific technology category, since many types of technologies may be used to address a specific situation. For example, the document may be specific to the verification of technologies capable of analyzing metals in soil, rather than the verification of x-ray fluorescence instruments.]

2. Draft specific test plans address the methodologies to be used to answer all of the questions that need to be answered to produce the verification statement performance factors. This includes not only the technical and analytical parameters, but also the operation, maintenance, labor, energy, and/or cost factors *if these are to be included in the ETV verification statement.*

   [Note: In some cases, test plans may be developed first. Generic protocols are then developed from the test plans following technology testing. This is often the case in situations where only one technology in a technology category participates in the first round of testing.]

3. Vendors participating in ETV evaluations are given the written draft specific test plan prior to participation and afforded an opportunity to comment on the document and request changes. The specific test plan may also be reviewed by a peer reviewer, preferably the same one that will be reviewing the verification reports. This will help to familiarize the reviewer with the test event and address and resolve any issues that the reviewer might have with the experimental design.

4. Dated draft specific test plans are placed on the ETV web site, clearly indicating that they are drafts, only if a generic test protocol is not available and if the draft specific test plan is ready for use in verification testing.

5. It is expected that test procedures will be modified during the course of testing; some only in small ways, others substantially. Appropriate notes will be kept on these changes.

6. Following the completion of tests, verification organizations and EPA managers will modify the draft specific test plan and the generic protocol, if it is available, based on the experience gained during the test and will remove the technology- and event-specific elements (i.e., make it more generic). The revised document will be placed on the ETV web site as a final generic protocol for an individual technology category.

7. Subsequent tests of technologies in the category will be conducted in a manner consistent with these generic protocols to the fullest extent possible. Generic protocols may in some cases be updated over time, and new specific test plans will be produced for each new test event.

Policy Source - April 1999 Team Meeting

2.4.3 A generic verification protocol and specific test plan should be posted on the ETV web site for each technology category

The generic verification protocol and the most recent specific test plan for a particular technology category should be posted on the ETV web site, if available. Only one test plan per technology category should be posted on the web site. A generic protocol or specific test plan should only be posted on the ETV web site if it has been developed to the point that it is ready for use in verification testing.

Policy Source - May 2001 Team Meeting

2.4.4 ETV Centers should employ a structured data quality planning process

ETV Centers should employ a structured data quality planning process such as the Agency's Data Quality Objectives (DQO) (EPA QA/G-4) process to develop generic test protocols and test plans. As part of the DQO process, ETV Centers will develop decision rules to aid in resolving testing issues, such as sampling program designs. Consistent use of a systematic data quality planning process ensures that future verification tests are designed to reflect the inherent variability in technology performance. ETV Centers should include a detailed description of their DQO process in their test plans and brief discussion of the process in each verification report.

Policy Source - May 2000 Science Advisory Board Review of ETV Program, May 2001 Team Meeting

2.5 Solicitation of Technology Vendors

2.5.1 Solicitation is open and is advertised widely, including in the Commerce Business Daily

The solicitation of vendors for participation in the ETV Program is open to all vendors of commercial-ready environmental technologies, both domestically and internationally. At a minimum, each ETV Center should ensure that the solicitation process is open to all vendors by advertising plans for verification testing of particular technology types in the *Commerce Business Daily*. Because this by itself has been found to be of limited effectiveness in reaching vendors, the use of supplemental solicitation methods, such as trade journals and letters to associations and individual companies, is strongly suggested.

Policy Source - Verification Strategy 1997, November 1997 Team Meeting

2.6 Development of Specific Test Plans

See policies 2.4.1, 2.4.2, and 2.4.3.

2.7 Technology Testing and Evaluation

2.7.1 Verification testing data are made publicly available

After testing occurs, the data are generally reviewed by ETV Center staff (verification organization and EPA) and validated data sets are then given to each participating vendor by the verification organization. Once testing begins, the test event will be completed, when possible and appropriate, and the data will be publicly reported. It is possible that unexpected circumstances (e.g., broken and irreparable equipment) could prevent the completion of verification testing. When test data are made publicly available, the ETV Program will not provide comparisons of vendors by name. Innovative

technologies may be compared to standard methodologies, if appropriate (e.g, comparison of field technologies to fixed-base laboratories).

Policy Source - November 1997 Team Meeting, April 1998 Team Meeting, May 2001 Team Meeting

2.7.2 Vendors must submit requests in advance to designate information as proprietary

It is the stated purpose of ETV to publish objective data on technology performance following a technology evaluation. In general, all data developed through the program are considered public information. Information submitted to ETV in support of verification activities is designated as proprietary only if a request is made in advance of the information submittal, as stipulated by the standard EPA policy on proprietary information. It is solely the responsibility of the vendor to make such a request, and no post-testing requests are allowed.

Policy Source - November 1997 Team Meeting

2.7.3 Existing data may be used in verifications under specific conditions

Although existing vendor-generated data are valuable, these data are not usually acceptable for verification purposes and should, in most cases, only be used to augment data generated during ETV testing. Key aspects of the minimum general acceptance criteria for existing data include: (1) the conditions under which the data were collected are clearly defined, (2) the data are quality assured, and (3) the data are collected objectively and independently of the vendor. In forming data requirements, the stakeholder group should be involved as appropriate. Additional acceptance criteria may be added to meet the needs of the individual ETV Center.

If the verification organization determines that a vendor's data report adequately evaluates the performance of the technology, then an independent data evaluation panel (DEP) is appointed. The DEP is composed of independent and credible members. The DEP reviews and agrees on the acceptance criteria and determines their applicability to the data to be evaluated. The verification organization provides a written summary of its review to the DEP, which in turn reviews and evaluates the data using the acceptance criteria. The DEP provides a written statement on the performance of the technology as demonstrated by the data, a statement of how well the data meet the acceptance criteria, and a data acceptance recommendation. EPA then reviews the report, determines whether to accept the data acceptance recommendation, and, if appropriate, signs the verification statement. [Note that no requests for verification through the existing data procedures outlined above had been received as of May 2001.]

The rationale supporting the use of existing data and details of the process for the use of existing data are contained in Appendix C: Environmental Technology Verification Program Existing Data: Policy and Process of the *ETV Quality and Management Plant for the Pilot Period (1995-2000)* (EPA 1998).

Policy Source - July 1997 Team Meeting, November 1997 Team Meeting, ETV Program QMP 1998

2.7.4 Vendors must pay for any re-testing of technologies

In general, vendors pay for all of the costs for re-testing any technology after testing is completed. For example, if a technology does not perform up to the vendor's expectations in the initial verification testing or is subsequently modified, the vendor would be required to pay for any re-testing of the technology.

Policy Source - April 1998 Team Meeting

2.7.5 Vendors may withdraw from the ETV Program before testing begins

In general, vendors may withdraw from the ETV Program only before testing begins. After testing, the ETV Program will issue and make publicly available a verification report, as discussed in Section 2.7.1. However, the vendor may choose not to have a verification statement issued.

Policy Source - November 1997 Team Meeting, May 2001 Team Meeting

2.7.6 ETV Centers need to obtain approval from EPA's Office of International Activities for funds spent on verification testing in a foreign country

ETV Centers that conduct verification testing at sites outside the U.S. need to obtain approval from EPA's Office of International Activities (OIA) for federal government funds (EPA or other federal funds) that are spent on the verification testing in the foreign country. International travel expenses related to the verification must also be approved by OIA.

Policy Source - EPA ETV Team

2.7.7 ETV Centers need to obtain approval from EPA's Office of International Activities when purchasing services from foreign contractors

ETV Centers need to obtain approval from EPA's Office of International Activities (OIA) when using federal government funds (EPA or other federal funds) to purchase contractor services from foreign firms to conduct verification testing at sites located in foreign countries. If an ETV Center uses a U.S.-based contractor to conduct verification testing in a foreign country and no funds are transferred to a foreign firm, approval from OIA is necessary.

Policy Source - EPA ETV Team

2.7.8 Participating vendors that request verification testing be conducted at a test site outside of the U.S. are required to contribute 100 percent of funding for all of the additional costs incurred by using this test site

If a vendor requests that verification be conducted at a test sites outside of the U.S., the vendor must contribute 100 percent of funding for all additional costs incurred by using the chosen test site. These additional costs include developing the test plan, conducting testing and QA, and travel and related expenses. The decision to test at a site outside of the U.S. will be made based on the cost-effectiveness of the testing location and the expected environmental benefits of the technology.

Policy Source - May 2001 Team Meeting

2.7.9 Full vendor payment should be collected prior to an ETV Center conducting any evaluation testing

ETV Centers should collect full vendor payment prior to conducting any evaluation testing, when possible. Otherwise, a vendor unsatisfied with preliminary test results could withdraw from the program and the ETV Center would not be able to complete testing or report writing. In cases where a participating vendor cannot provide funding up front (e.g., small companies), the vendor should be required to pay in full before the raw data are evaluated.

Policy Source - May 2001 Team Meeting

2.8 Data Package Approval/QA Evaluation

2.8.1 Verification organizations are responsible for the maintenance of "raw data"

In keeping with standard EPA practice, verification organizations must retain all data, logs, and records on each ETV test for seven years.

Policy Source - ETV Program QMP 1998

2.8.2 Technical systems audits were performed by EPA and the verification organization during the pilot period and will continue to be performed by the verification organization

A technical systems audit is a qualitative onsite audit of the physical setup of a technology test. Technical systems audits were performed to determine the compliance of testing personnel with the test and QA plans. Each assigned EPA pilot QA manager arranged to conduct technical systems audits for each pilot during the ETV Program pilot period. As the ETV Program continues, each verification organization should conduct their own technical systems audits based on the frequency outlined in the Center QMP, but no less than once for each technology category. Assessments by the verification organization remained steady throughout the duration of the ETV Program pilot period, but assessments by EPA decreased in keeping with the policy of preparing the ETV Centers to operate independently in the future. Verification organizations will continue to perform technical systems audits throughout the duration of the ETV Program. EPA's continued oversight of the ETV Centers will include technical systems audits on a less frequent schedule than during the pilot period. Each technical systems audit should result in a report describing the audit results. This audit report should be reviewed by the EPA Center manager, the assigned EPA Center QA manager, and the verification organization Center manager. Responses to adverse findings are required within 10 working days of receiving the audit report. Follow-up by the auditors and documentation of the response are required. Section 9.1 of the ETV QMP discusses the types and frequency of assessments in the ETV Program.

Policy Source - ETV Program QMP 1998

2.8.3 Data quality audits are primarily conducted by the verification organization, although EPA may conduct independent audits

A data quality audit is a qualitative and quantitative audit in which data and data handling are reviewed and data quality and data usability are assessed. Data quality audits should be conducted by the verification organization for each technology evaluation based on the procedures outlined in the Center QMP and/or the *ETV QMP* (EPA 1998). During these self-assessments, the verification organization

should conduct audits of at least 10 percent of all of the verification data, including raw data and summary data. The Center QMP should explain the basis for the 10-percent assessment. Independent data quality audits by EPA Center QA managers also may be conducted, as appropriate for each ETV Center. Each data quality audit should result in a report describing the audit results. This audit report should be reviewed by the EPA Center manager, the assigned EPA Center QA manager, and the verification organization Center manager. Responses to adverse findings are required within 10 working days of receiving the audit report. Follow-up by the auditors and documentation of the response are required. Section 9.1 of the ETV QMP discusses the types and frequency of assessments in the ETV Program.

Policy Source - ETV Program QMP 1998

2.8.4 Performance evaluation audits are conducted by both EPA and the verification organization

Performance evaluation audits are conducted by the verification organization's Center QA manager periodically to determine the bias of the total measurement system(s). The EPA Center QA manager may perform performance evaluation audits as appropriate to the project. As part of a performance evaluation audit, a laboratory analyzes a performance evaluation sample. Performance evaluation audits are provided for in the test/QA plan, as applicable for each ETV Center.

Policy Source - ETV Program QMP 1998

2.9 Development of Verification Statement and Report

2.9.1 Verification statements follow strict format guidelines

Each verification statement shall be included in the associated verification report on the first page after the report cover. The verification statement shall contain the information presented in the sample box below in the same format. The information in this box is the only information that can be changed in a verification statement following its issuance. This information will be updated as needed to ensure that customers of the verification information can use it.

TECHNOLOGY TYPE:	**WIDGET**		
APPLICATION:	**ADVANCED REMOTE WIDGETING**		
TECHNOLOGY NAME:	**WIDGET - 2000 - A**		
COMPANY:	**USA Widget, Inc.**		
ADDRESS:	**1999 Main Street** **Somewhere, USA 00001**	**PHONE:** **FAX:**	**(000) 555-2000** **(000) 555-2001**
WEBSITE:	**http://www.usawidget.com**		
EMAIL:	**widget@usawidget.com**		

Policy Source - May 2001 Team Meeting

2.9.2 ETV verification reports are published to provide data and summaries of an individual technology's performance

The ETV Program verification reports and statements provide a summary of the performance of a technology (for a specific test period). Although similar technologies are sometimes tested using the same or very similar test plans, the ETV Program does ***not*** provide comparisons of technology performance. The ETV Program believes that the final responsibility rests with the end user/customer to determine whether the technology performance provided in the verification report and summarized in the statement meets the requirements of the customer.

Policy Source - April 1998 Team Meeting

2.9.3 The verification statement requires EPA and verification organization representative signatures

Each verification statement should include the signatures of the EPA laboratory director or equivalent and the appropriate verification organization representative. (Verification statements for technologies completed prior to this policy may include only the appropriate EPA signature.) Technology tests conducted with the substantial support of other organizations may have third or fourth signatures as appropriate. For example, the ETV Program now has an agreement with Department of Defense's Environmental Security Testing and Certification Program to conduct joint verification activities. Verifications conducted by both programs will bear joint signatures. Three original verification statements must be signed and one each distributed to the originating EPA office, the verification organization, and the vendor.

Policy Source - April 1998 Team Meeting

2.9.4 The verification organization is primarily responsible for drafting the verification report

In general, it is the responsibility of the verification organization to complete verification reports and manage the peer review process. The verification organization should have appropriate staff (either in-house or through contractual agreements) for the technical development and editing of the reports. To the fullest extent possible, the reports should be developed simultaneously with the testing effort and review of all "boilerplate" language should be completed in advance to allow for a more efficient report writing process. Thus, only the results section of the report would need to be produced after testing is completed. Expedited peer review procedures should be designed and implemented by the verification organization. Peer reviewers are typically subject matter experts that are external to both EPA and the verification organization. Stakeholders may serve as peer reviewers.

Policy Source - November 1997 Team Meeting

2.9.5 EPA has specific review requirements for verification statements and reports

Each technology evaluation under the ETV Program results in a verification statement and a verification report. The verification organization Center manager is responsible for coordinating their development. These two documents, including revisions, shall be reviewed by qualified personnel for conformance with technical requirements and quality system requirements and approved for release by authorized personnel. Specifically, verification statements should be reviewed by the EPA Center

manager, the EPA Center QA manager, the vendor, the ETV Program Director, and an EPA reviewer external to the ETV Program. Verification statements are considered final when signed by the appropriate EPA laboratory director or equivalent. Verification reports should be reviewed by the assigned EPA Center QA manager and the vendor, and should be reviewed and approved by the EPA Center manager (see Section 5.3 of the ETV QMP).

Policy Source - ETV Program QMP 1998

2.9.6 Cooperative agreements should include specific requirements for publishing documents, such as verification statements and reports

Sections 5.1 and 5.2 of the ETV QMP describe in detail the procedures for reviewing, approving, publishing, and storing ETV documents. These procedures should be included in cooperative agreements between ETV Centers and other organizations, between EPA and verification organizations, and between verification organizations and their contractors.

Policy Source - ETV Program QMP 1998

2.9.7 In general, the verification statement is valid for an unspecified period of time

A verification statement is issued for each technology tested under the ETV Program. Each statement provides a performance summary for the specific technology tested. In general, no time limit is included in the verification statement. However, in certain instances, a verification statement may indicate a termination date or condition for making it invalid. It is the responsibility of each vendor to decide whether the verified technology has changed enough in any way so that the verification statement is no longer valid. Although the ETV Program has no legal right to require re-testing of a vendor's technology, the ETV Program reserves the right to announce when it believes a verification statement no longer represents the technology that was tested.

[Note: The Air Pollution Control Technology Pilot, at the insistence of its stakeholder group, requires annual re-testing for all filters tested under the Paint Overspray Arrestor (POA) technology category (bearing the same model number). An excerpt from the POA generic protocol is presented below.

> "It is assumed that sufficient changes would occur over a 12-month period that a new verification test is warranted. Therefore, a new verification test will be required every 12 months for POA bearing the same model number as a previously verified manufacturer's product." Generic Verification Protocol for Paint Overspray Arrestors October 15, 1998.

The Pilot had a similar re-testing requirement for baghouse filtration technologies, at an interval of three years. The baghouse generic protocol included a statement similar to the one above for POA technologies, but specifying a three-year period instead of a 12-month period.]

Policy Source - April 1998 Team Meeting

2.9.8 If the ownership or name of a verified technology changes, the verification statement, report, and ETV logo may still be used for the technology as long as the technology performance and design have not changed

Companies with verified technologies may be acquired by other companies, change their name, or change the name of their verified technologies. As long as the technology remains the same, and there are no performance or design changes, the new company, company with a name change, and/or company with a technology name change may continue to use the verification statement, report, and ETV logo in accordance with ETV Program guidelines. The ETV Program will change the ownership and contact information in the box on the first page of the verification statement and report (new names, phone numbers, web sites, etc.) if this information changes (see section 2.9.1 for example). A simple footnote will indicate that "the report was originally written for the XYZ Company which has been purchased by the ABC Company" or "the XYZ Company has moved from Ontario to Pittsburgh" or "the technology originally verified as the DEF Widget is now called the GHI Widget."

Policy Source - May 2001 Team Meeting

2.9.9 Discovery of technology misrepresentation may lead to verification revocation

If EPA discovers that a technology is being misrepresented after a verification statement has been issued, the verification will be revoked if necessary. However, EPA will first notify the vendor of the misrepresentation and work with the vendor to resolve the issue. If the vendor does not cooperate to resolve the problem, then EPA may initiate the revocation process.

Policy Source - November 1997 Workshop

2.9.10 Separate test events for the same technology may merit a separate verification for the technology, resulting in multiple ETV verifications of a single technology

Some technologies may be tested during separate test events, either at different facilities, under different conditions, or using different performance criteria. If a single technology undergoes separate and significantly different test events, the technology should receive a separate verification statement and report for each different test. This may result in more than one performance verification for a single technology. The verification statement and report for one test event should reference the verification statement and report from the other test event.

Policy Source - May 2001 Team Meeting

2.10 Information Diffusion

2.10.1 Specific guidelines exist for use of the ETV name, logo, and verification information

The complete policy on using the ETV logo is included in Appendix A to this document. A summary is provided below.

EPA oversees proper use of the Environmental Technology Verification Program name and logo. The name and logo may be used for general educational purposes by anyone without specific permission from the Agency. The name and logo may be used when describing the ETV Program, such as in an educational brochure, a newsletter, an annual report, or in a general news or scientific article. Vendors of verified technologies may use the ETV logo to advertise the availability of verification information

and the fact that the technology has been verified under the ETV Program. **Under no circumstances shall the name or logo be used in a manner that would imply EPA endorsement, approval, certification, validation, guarantee, or warranty of the company, its products, its technologies, or its services.**

The logo may be used only after the vendor has received the completed ETV verification statement and report. After the verification statement and report are issued, the logo may be used in print or electronic advertising, promotional, and sales materials. When the logo is used by a vendor or developer in connection with a technology or its advertising, it shall always be accompanied by the following disclaimer:

> Information on the performance characteristics of [technology name] can be found at www.epa.gov/etv or by calling [vendor contact] at xxx-yyy-zzzz for a copy of the Environmental Technology Verification Report. The use of the Environmental Technology Verification Program℠ Name or Logo does not imply approval or certification of this product, nor does it make any explicit or implied warranties or guarantees as to product performance.

Policy Source - Draft Guidelines for Proper Use of the Environmental Technology Verification Program℠ Name and International Logo (Version 2.1)

2.10.2 Key ETV Program outputs are placed on the ETV web site

The goal of the ETV web site (www.epa.gov/etv) is to assure that the most up-to-date information about all parts of the program is available to the interested public in a timely fashion. If achieved, this will facilitate access to information for all customers, provide better communication among ETV Team members and partners, and provide an immediate, accurate account of ETV technologies and activities. The following web site categories contain key information about each of the ETV Centers: ETV Calendar of Events, Center Highlights, Center Fact Sheets, Stakeholder Group Lists, Announcements and Meeting Summaries, Protocols and Test Plans, Verification Statements, Verification Reports, Technologies Under Evaluation, Articles, and Links to ETV Partner Web Sites. The web site has recently been updated to reflect the end of the pilot period.

Policy Source - October 1998 Team Meeting

2.10.3 Technology profiles should be developed by the verification organization in conjunction with development of the verification statement and report

Technology profiles describe verified technologies and provide company contact information for consumers. Technology profiles are especially useful when multiple vendors are verified under one technology category, as they provide photos of and information on each verified technology. However, technology profiles should not compare performance characteristics of technologies. Technology profiles should be developed in conjunction with the verification statements and reports so that the profiles are ready for distribution when the report and statement are published.

Policy Source - May 2001 Team Meeting

2.10.4 Technology profiles must be reviewed and accepted by the vendor(s) prior to distribution

To ensure that all information in technology profiles is accurate, the profiles should be reviewed and approved by vendors prior to distribution.

Policy Source - May 2001 Team Meeting

2.10.5 The verification organization is responsible for providing a web-ready version of the final verification report, statement, and technology profile to the ETV Program web master

As soon as the verification statements, reports, and technology profiles are completed for each technology category, the verification organization is responsible for providing web-ready versions of these documents to the ETV Program web master. These documents will be promptly placed on the ETV Program web site by the web master.

Policy Source - May 2001 Team Meeting

2.10.6 Documents under active review should not be posted on the ETV web site

The primary purpose of the ETV Program web site is information diffusion to purchasers, permitters, vendors, and the general public. Therefore, documents under active review should not be posted on the web site.

Policy Source - May 2001 Team Meeting

2.10.7 Interim final protocols and test plans should be posted on the ETV web site

The primary purpose of the ETV Program web site is information diffusion to purchasers, permitters, vendors, and the general public. Therefore, interim final protocols and test plans (i.e., those ready for use in testing) should be posted on the ETV web site.

Policy Source - May 2001 Team Meeting

2.10.8 ETV Centers will give ETV Stands to vendors participating in the ETV Program and ETV Disks to vendors who have a verified technology

An ETV Stand will be given by the appropriate ETV Center to vendors participating in the ETV Program upon receiving their full payment for testing. It is to be used by vendors to show that their technology is being verified by the ETV Program. The ETV Stand is to be used by vendors at conferences and other meetings where they are displaying the specific technology being verified by ETV or information about that technology. The ETV Centers will provide a letter to each vendor detailing the purpose and proper use of the ETV Stand.

An ETV Disk will be given by the appropriate ETV Center to vendors receiving verification reports for a technology under the ETV Program. The ETV Disk can be used by vendors at conferences and other meetings where they are displaying the technology or information about the technology that ETV has verified. The ETV Disk can be affixed to a booth or table or to the technology itself if it is

being displayed. The ETV Centers will provide a letter to each vendor detailing the purpose and proper use of the ETV Disk.

Policy Source - May 2001 Team Meeting

3.0 References

EPA. February 1997. ETV Program Verification Strategy. Office of Research and Development. EPA/600/K-96/003.

EPA. May 1998. Quality and Management Plan for the Pilot Period (1995-2000). Office of Research and Development. EPA/600/R-98/064.

EPA. December 2000. Guidelines for the Proper Use of the Environmental Technology Verification Program Name and International Logo. Draft. Version 2.1. Office of Research and Development.